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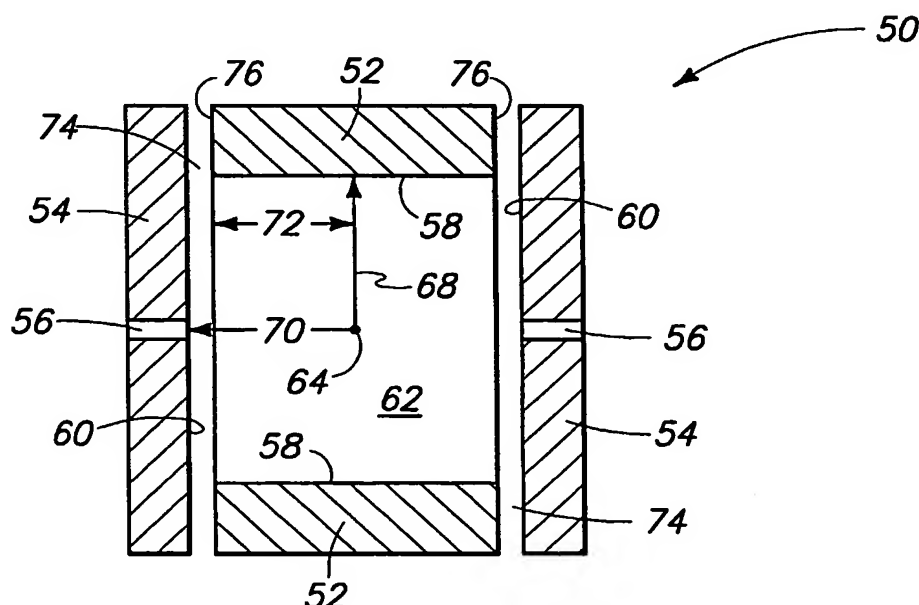
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#### Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for all designations
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU,

[Continued on next page]

(54) Title: PROCESSES FOR DESIGNING MASS SEPARATORS AND ION TRAPS, METHODS FOR PRODUCING MASS SEPARATORS AND ION TRAPS. MASS SPECTROMETERS, ION TRAPS, AND METHODS FOR ANALYSING SAMPLES



(57) Abstract: A mass separator and mass spectrometer comprising an ion trapping means (50) comprising a cylindrical electrode (52) and capping electrodes (54) having bores (56) therethrough for the controlled passage of ions.



ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

— of inventorship (Rule 4.17(iv)) for US only

**Published:**

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# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/38587

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : H01J 49/00,40,42; H01T 19/04  
US CL : 250/281,282,284,285,286,287,288,396R,396ML

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 250/281,282,284,285,286,287,288,396R,396ML

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
NONE

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A, E	US 6,686,592 B1 (SAKAIRI et al.) 03 February 2004 (03.02.2004), Fig. 3 and 7, columns 10-13.	1-67
Y	US 5,420,425 A (BIER et al.) 30 May 1995 (30.05.1995), Fig. 1, 4b, 5b-5c, 6, columns 13-16.	1,7,9
—		2-6,8,10-67
A	US 4,882,484 A (FRANZEN et al.) 21 November 1989 (21.11.1989), Fig. 1 and 7, columns 5-6, especially lines 5-68 on column 5.	1-67
A	US 4,540,884 A (STAFFORD et al.) 10 September 1985 (10.09.1985), column 6 to column 8 line 55.	1-67

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on , ority claim(s) or which is cited to establish the publication date of another itation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

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"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

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document member of the same patent family

Date of the actual completion of the international search

14 April 2004 (14.04.2004)

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10 AUG 2004

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Authorized officer

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**Box No. VIII (ii) DECLARATION: ENTITLEMENT TO APPLY FOR AND BE GRANTED A PATENT**

*The declaration must conform to the standardized wording provided for in Section 212; see Notes to Boxes Nos. VIII, VIII (i) to (v) (in general) and the specific Notes to Box No. VIII (ii). If this Box is not used, this sheet should not be included in the request.*

Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent (Rules 4.17(ii) and 51bis.1(a)(ii)), in a case where the declaration under Rule 4.17(iv) is not appropriate:

Griffin Analytical Technologies, Inc. is entitled to apply for and be granted a patent by virtue of the following:

an assignment from:

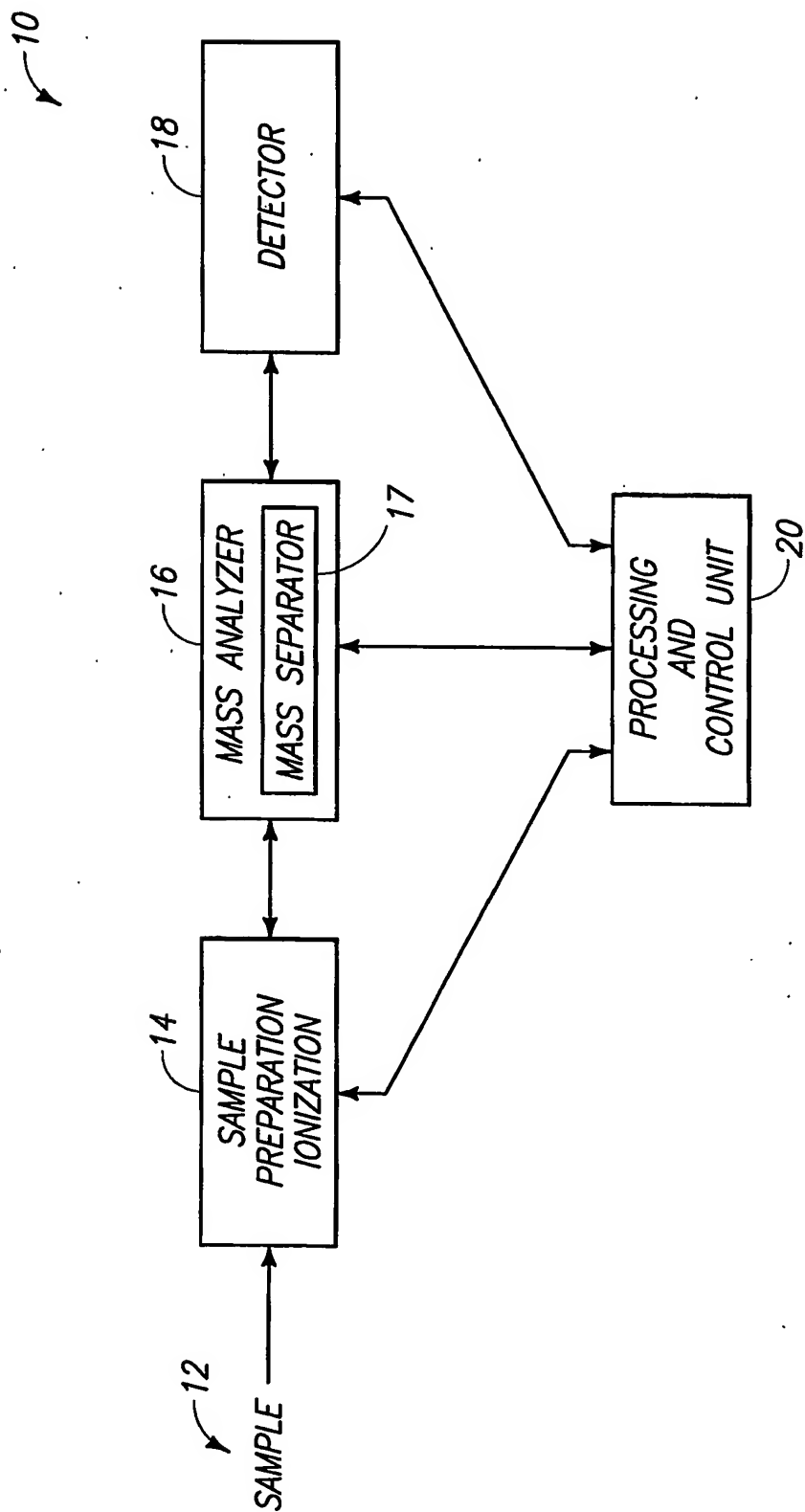
WELLS, James Mitchell, 3636 Redondo Dr., Lafayette, IN 47905, United States of America, dated 09 February, 2004 (09.02.04); and

PATTERSON, Garth E., 802 S. Brackney, Brookston, IN 47923, United States of America, dated 09 February, 2004 (09.02.04).

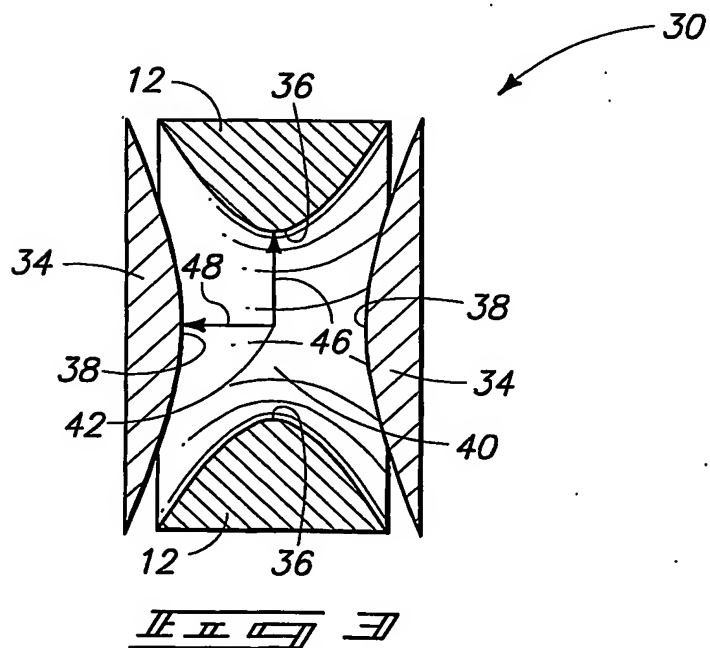
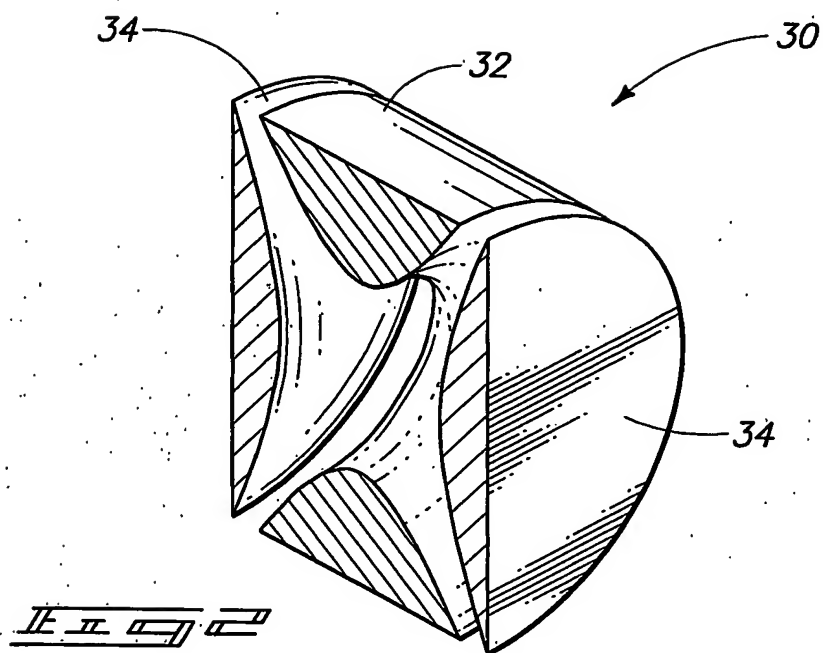
This declaration is made for the purposes of all designations.

☐ This declaration is continued on the following sheet, "Continuation of Box No. VIII (ii)".

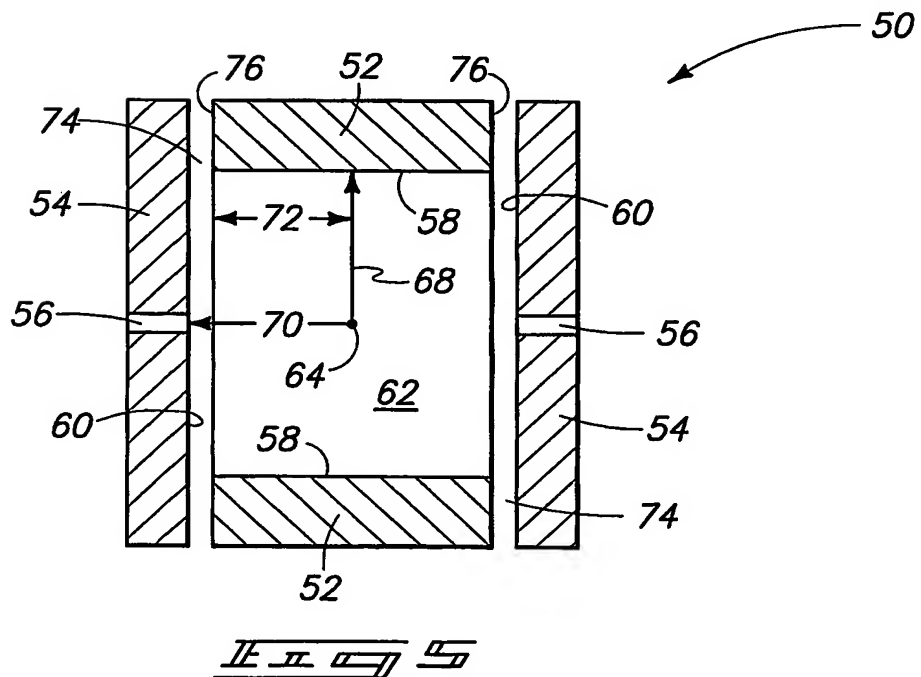
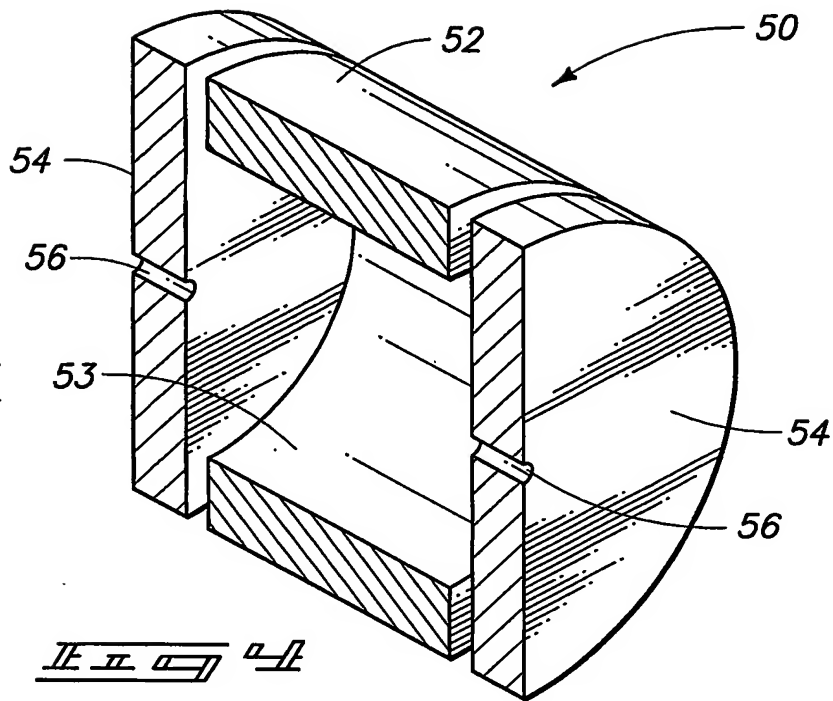
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FIG. 1

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Strength of octapole relative to quadruple ( $A_4/A_2$ ) as a function of  $Z_0/r_0$  at 0.06 electrode spacing

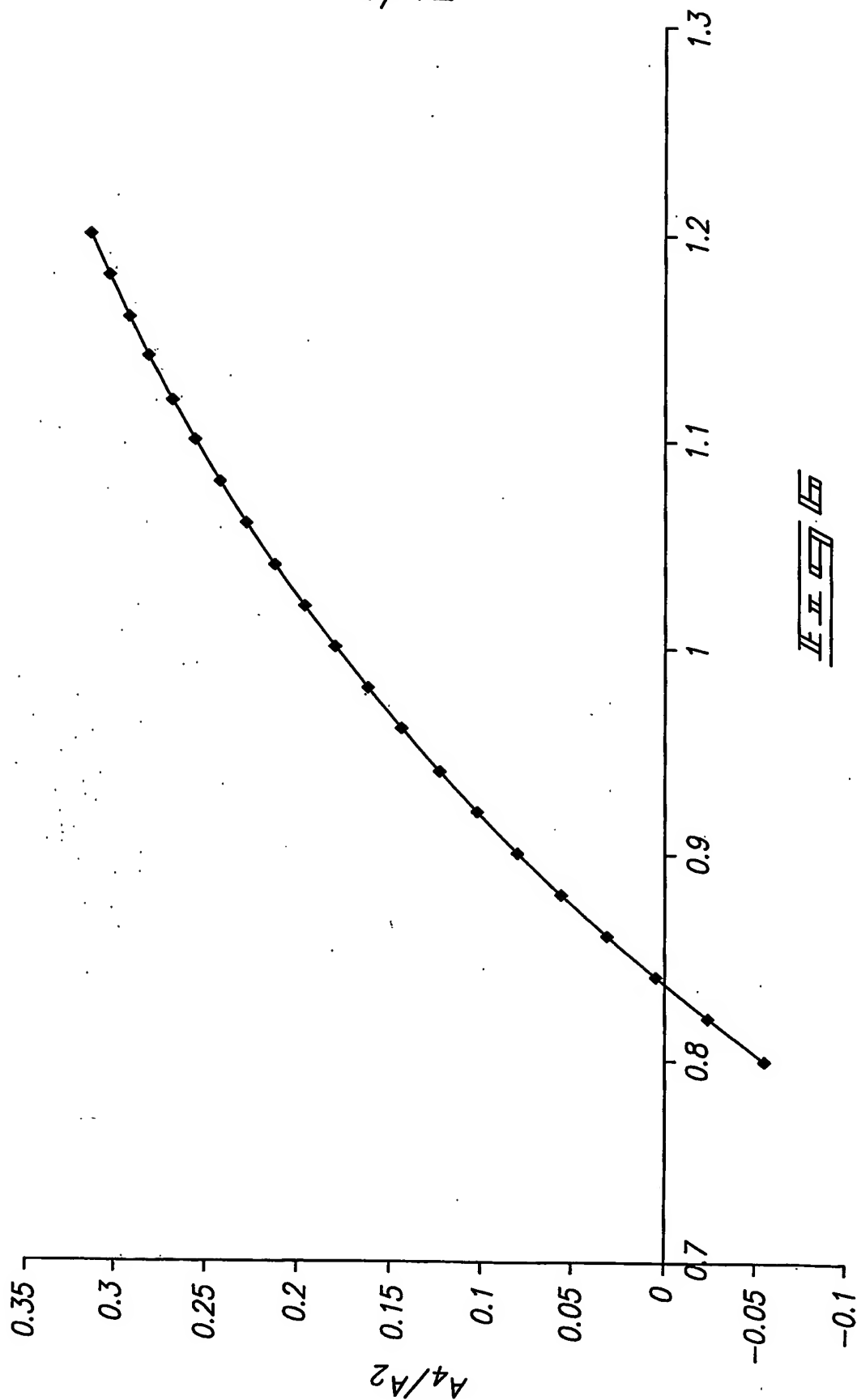
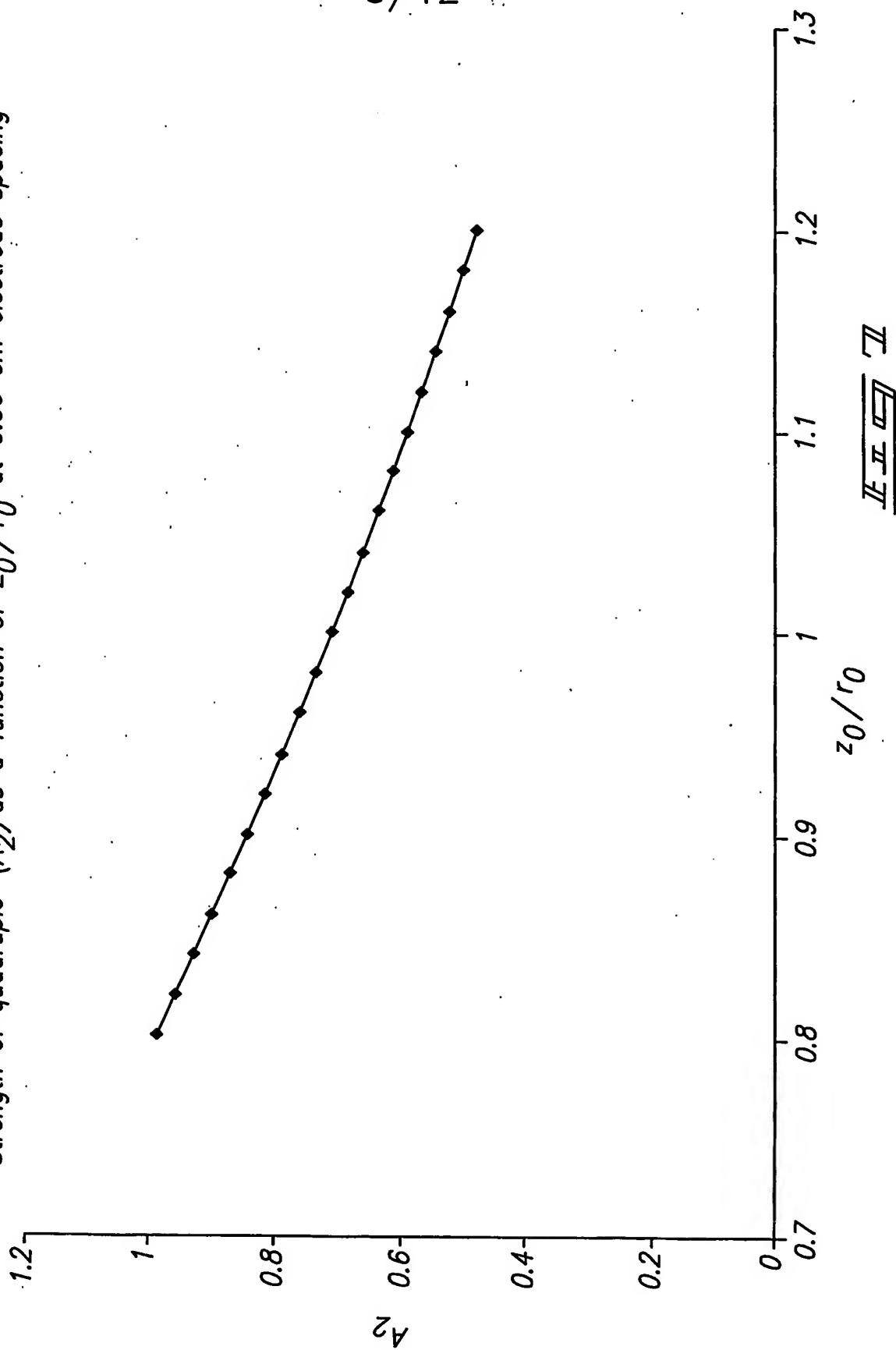


FIG. 10



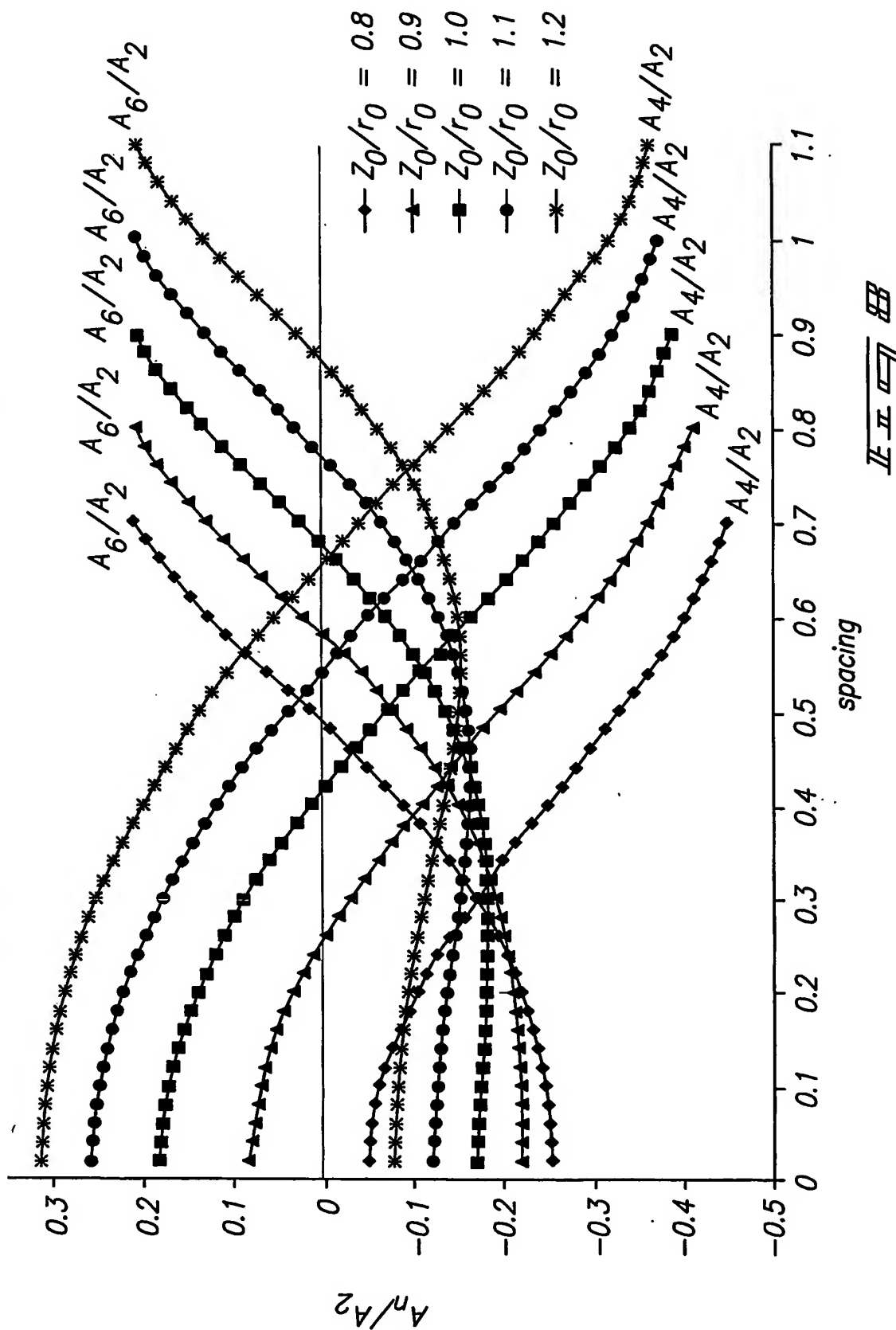
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Strength of quadrupole ( $A_2$ ) as a function of  $z_0/r_0$  at 0.06 cm electrode spacing

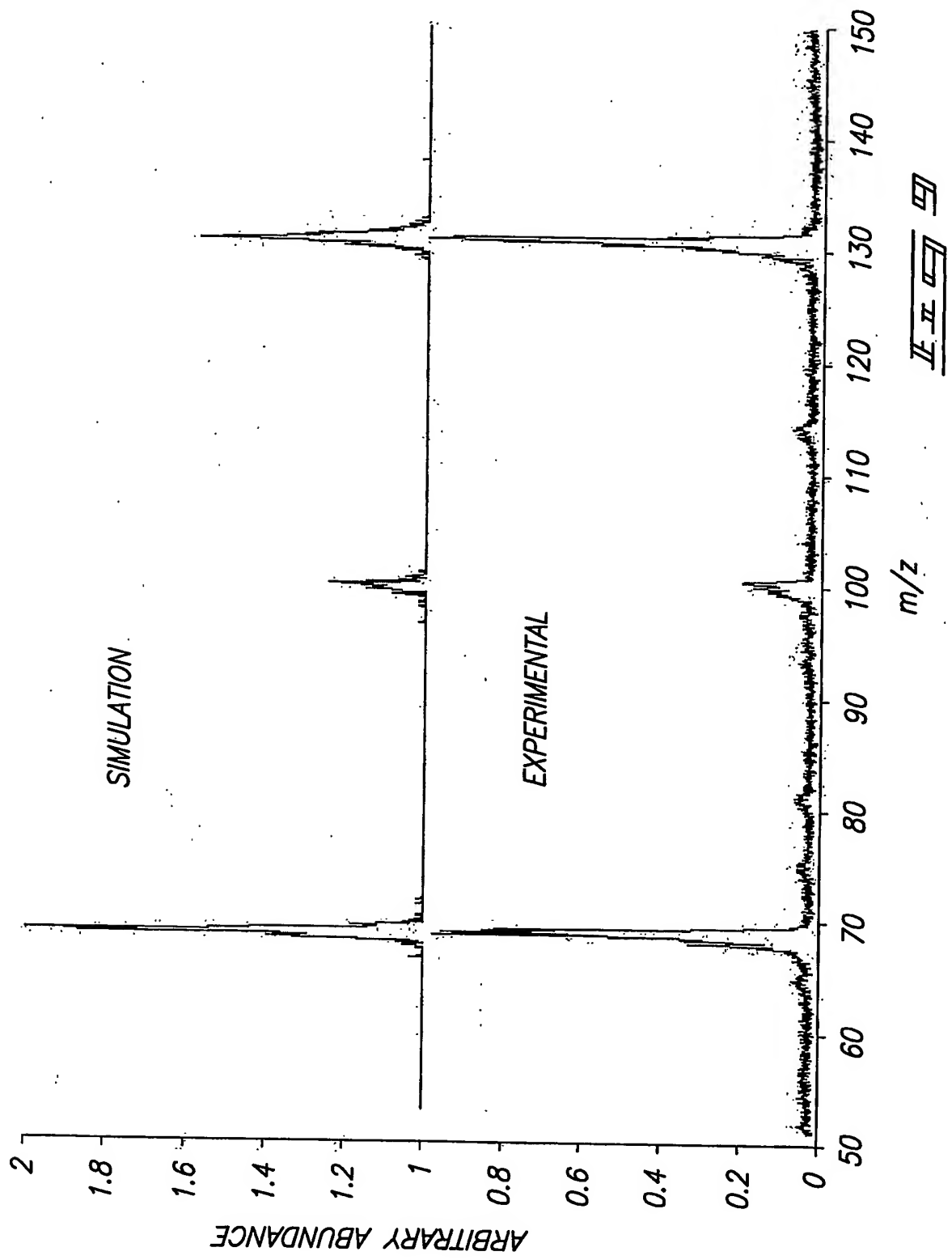


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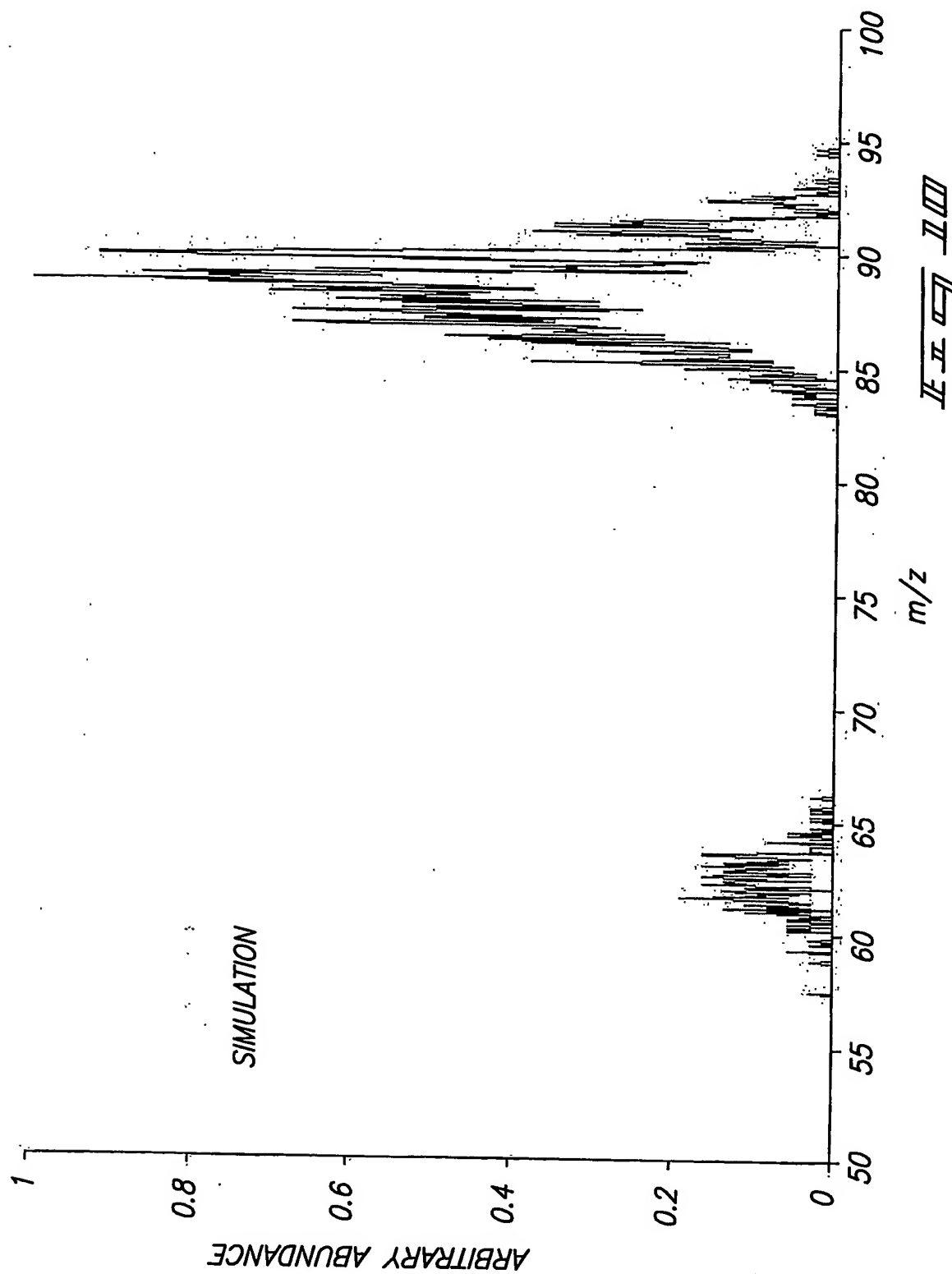
$A_n/A_2$  as function of spacing for various  $Z_0/r_0$  ratios



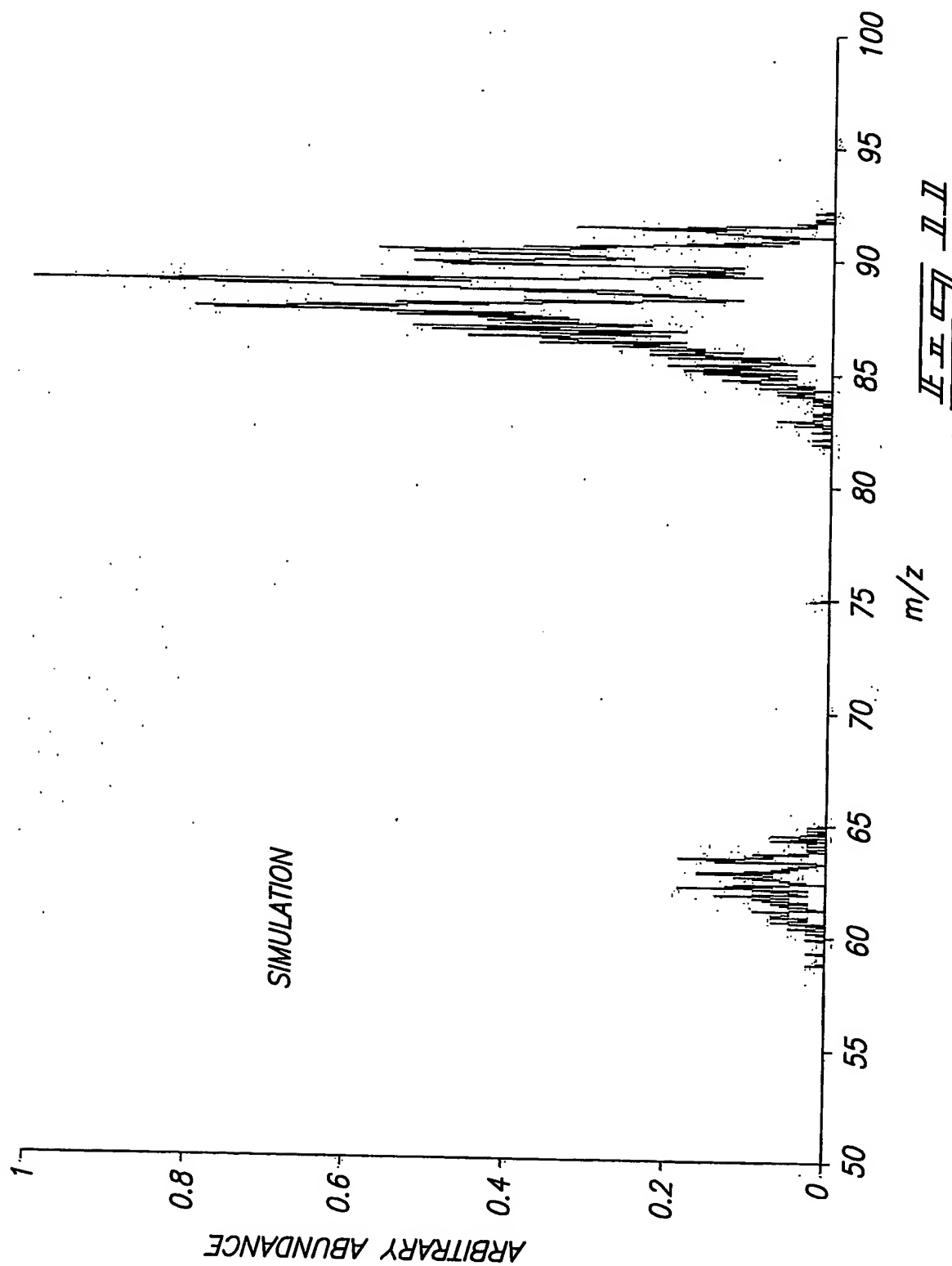
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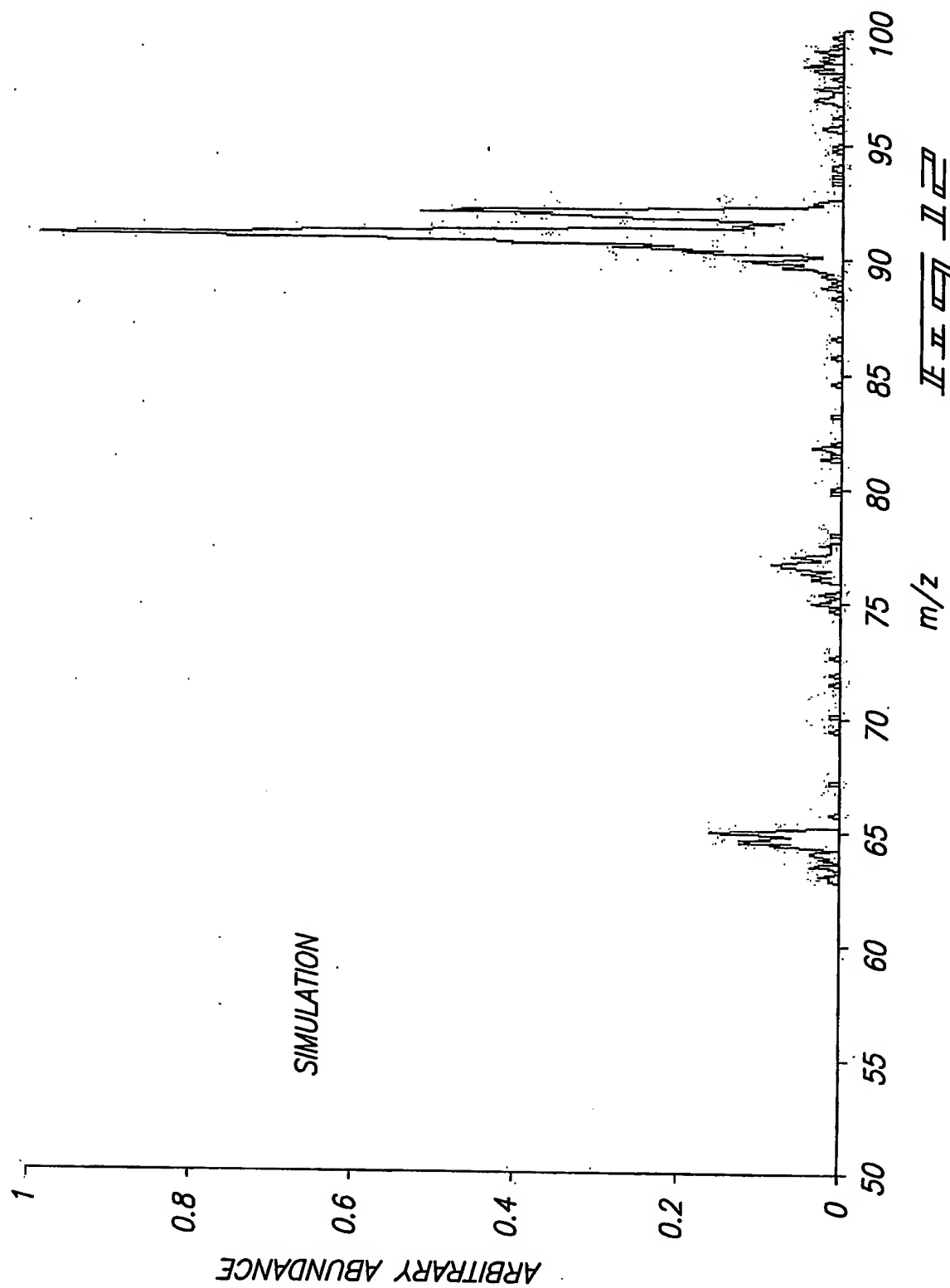
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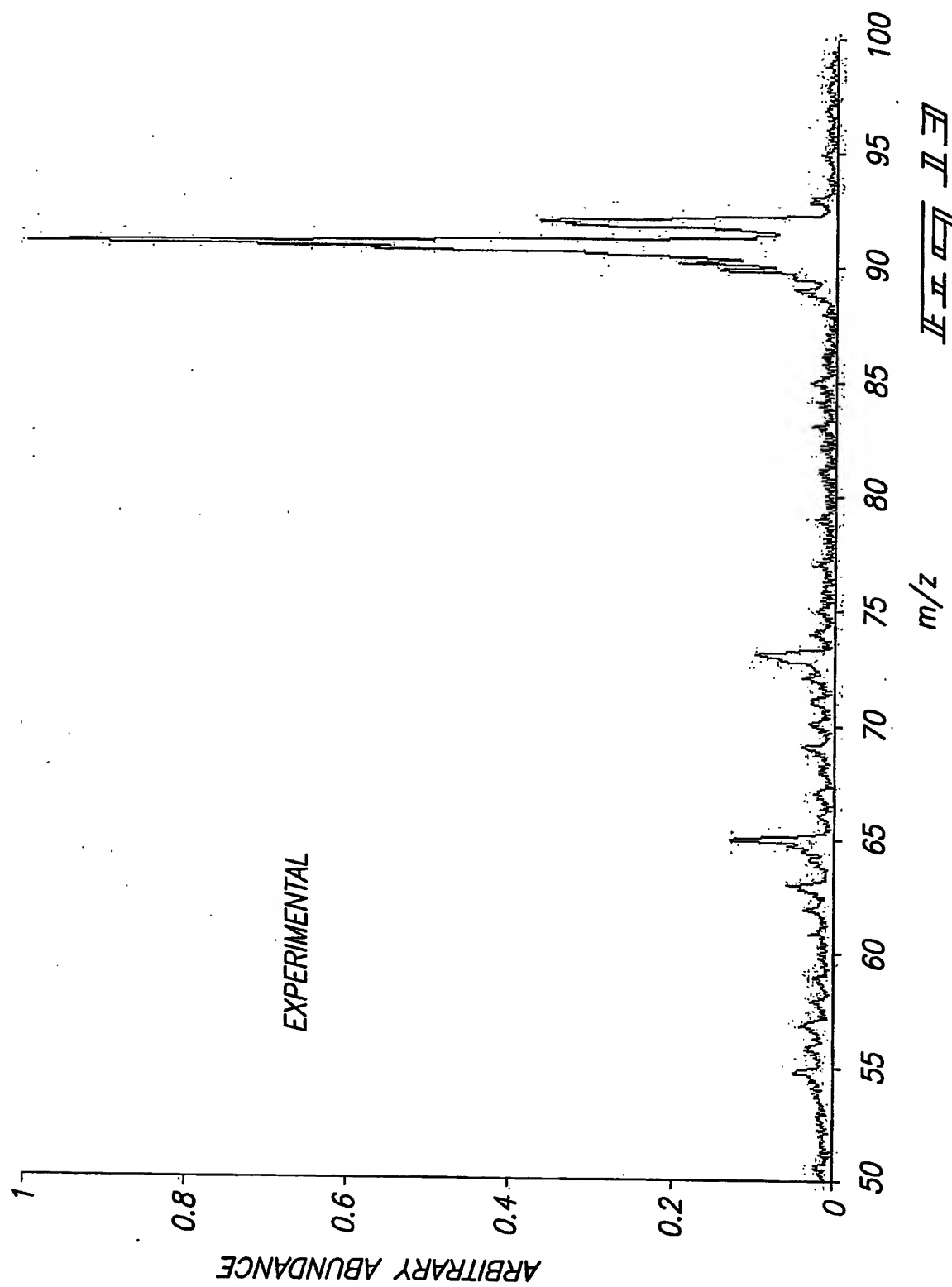
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